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# **WATER SUPPLY OUTLOOK FOR MONTANA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,

and  
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF  
MAY 1, 1969



## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

## PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85205
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80521
Idaho	P. O. Box 38, Boise, Idaho 83707
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Building, Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 340, Casper, Wyoming 82602

## PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



# **WATER SUPPLY OUTLOOK FOR MONTANA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

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MONTANA WATER SUPPLY OUTLOOK  
May 1, 1969

\* \* \* \* \*

\* Almost all snow courses in the State had snow \*  
\* melt during April. Streamflow during April \*  
\* was generally 150 to 200 percent average. \*  
\* Low elevation snow is gone. \*  
\* Most mountain soils are saturated. \*  
\* \* \* \* \*

COLUMBIA RIVER DRAINAGE

Snow - Almost all elevations had melt during April. Low snow is gone and median elevation snow shows substantial melt. There was less melt at higher elevations. Most high elevation snow courses have about the same water content as for the last two months. Snow cover is 80 to 85 percent average for this date.

Streamflow - Runoff during April was well above average on all streams. In general, flows were 150 to 200 percent average. Runoff for the next five months is forecast near average on the Kootenai, Blackfoot, Bitterroot, Flathead Rivers and their tributaries. Above average flows are expected in the headwaters of the Clark Fork and on tributaries to the Lower Clark Fork. Runoff a little below average is forecast for the Middle Fork Flathead River.

Late season irrigation supplies are expected to be near average.

# Mathematical Analysis

1. Let  $f(x)$  be a function defined on the interval  $[a, b]$ .  
2. The function  $f(x)$  is said to be continuous at a point  $x_0$  if  
3.  $\lim_{x \rightarrow x_0} f(x) = f(x_0)$ .  
4. If  $f(x)$  is continuous at every point in the interval  $[a, b]$ ,  
5. then  $f(x)$  is said to be continuous on  $[a, b]$ .  
6. The function  $f(x)$  is said to be differentiable at a point  $x_0$  if  
7. the limit  $\lim_{h \rightarrow 0} \frac{f(x_0 + h) - f(x_0)}{h}$  exists.  
8. This limit is called the derivative of  $f(x)$  at  $x_0$ , denoted by  $f'(x_0)$ .

9. The derivative of a function  $f(x)$  at a point  $x_0$  is denoted by  $f'(x_0)$ .  
10. If  $f(x)$  is differentiable at  $x_0$ , then  $f'(x_0)$  is the slope of the tangent line to the graph of  $f(x)$  at the point  $(x_0, f(x_0))$ .  
11. The derivative of a function  $f(x)$  at a point  $x_0$  is denoted by  $f'(x_0)$ .  
12. If  $f(x)$  is differentiable at  $x_0$ , then  $f'(x_0)$  is the slope of the tangent line to the graph of  $f(x)$  at the point  $(x_0, f(x_0))$ .  
13. The derivative of a function  $f(x)$  at a point  $x_0$  is denoted by  $f'(x_0)$ .  
14. If  $f(x)$  is differentiable at  $x_0$ , then  $f'(x_0)$  is the slope of the tangent line to the graph of  $f(x)$  at the point  $(x_0, f(x_0))$ .  
15. The derivative of a function  $f(x)$  at a point  $x_0$  is denoted by  $f'(x_0)$ .  
16. If  $f(x)$  is differentiable at  $x_0$ , then  $f'(x_0)$  is the slope of the tangent line to the graph of  $f(x)$  at the point  $(x_0, f(x_0))$ .  
17. The derivative of a function  $f(x)$  at a point  $x_0$  is denoted by  $f'(x_0)$ .  
18. If  $f(x)$  is differentiable at  $x_0$ , then  $f'(x_0)$  is the slope of the tangent line to the graph of  $f(x)$  at the point  $(x_0, f(x_0))$ .  
19. The derivative of a function  $f(x)$  at a point  $x_0$  is denoted by  $f'(x_0)$ .  
20. If  $f(x)$  is differentiable at  $x_0$ , then  $f'(x_0)$  is the slope of the tangent line to the graph of  $f(x)$  at the point  $(x_0, f(x_0))$ .

## MISSOURI RIVER DRAINAGE

Snow - There was considerable melting during April at lower elevations. High elevation snow remains about the same as last month. Normally, high elevation snow increases during April. Snow pack is near average in the Jefferson and Madison River headwaters. The Gallatin drainage is about 15 percent below average, while snow pack in the remaining Missouri drainages is 55 to 75 percent average.

Streamflow - Runoff during April was generally 150 to 250 percent average, reflecting the low elevation snowmelt. Streamflow for the next five months is forecast above average in Missouri River headwaters and below average in the Smith, Dearborn, Sun, Teton and Marias River drainages. Late season irrigation supplies are expected to be near average over most of the area, except below average on streams originating in the Castle, Little Belt, Big Belt, and Snowy Mountains.

## YELLOWSTONE RIVER DRAINAGE

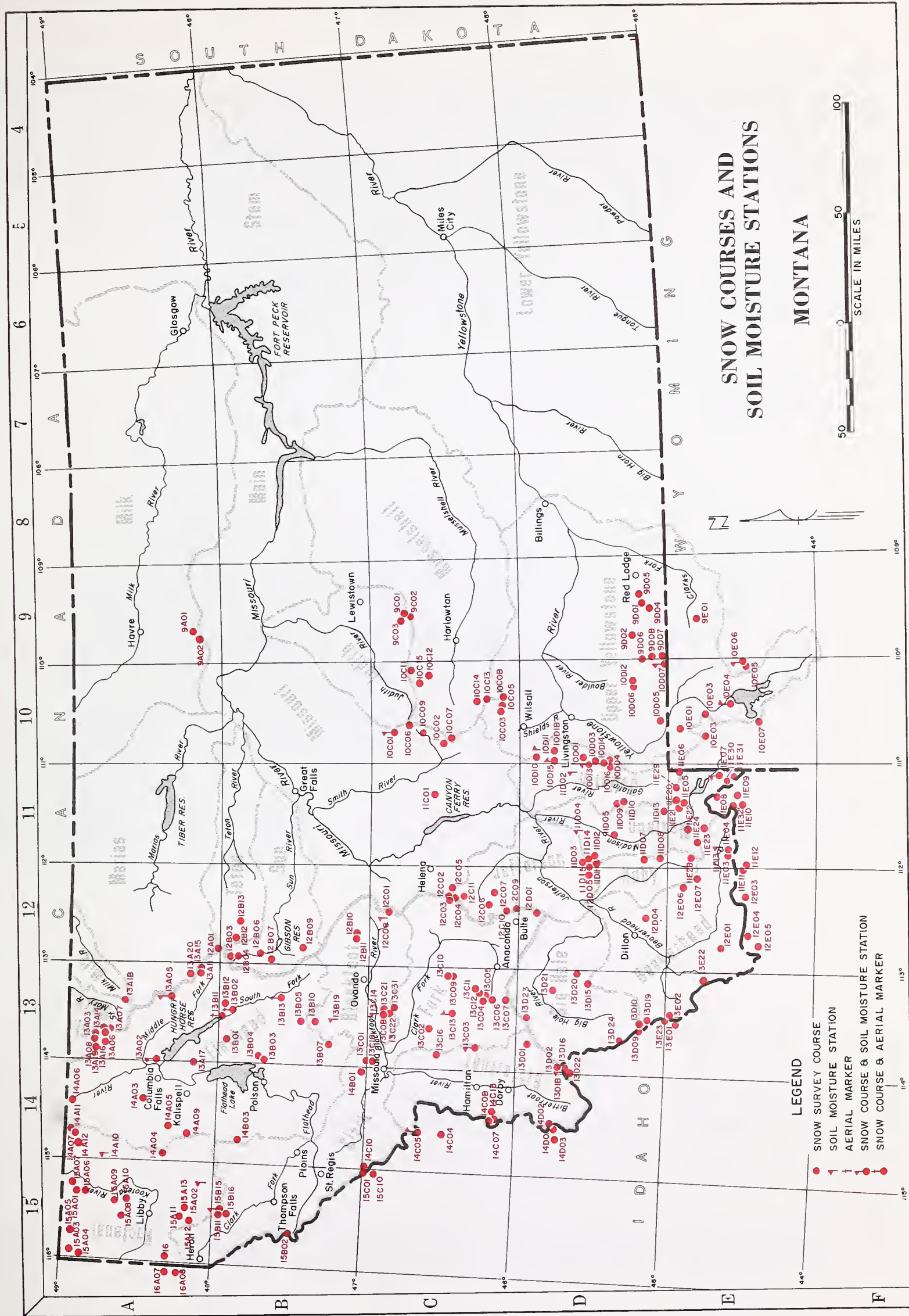
Snow - Except at high elevations, there was considerable melting during April over the drainage. Snow in higher areas is about the same as a month ago. Snow cover in the Yellowstone River headwaters is about 75 percent of average for this date. In the Big Horn River drainage of Wyoming, snow cover is about 70 percent average.

Streamflow - Runoff during April was 150 to 200 percent average on all streams. Streamflow for the next five months is forecast near average on the Yellowstone River tributaries above the Big Horn River, and about 90-95 percent below average below the Big Horn River. The Big Horn River is forecast 85 percent average above the junction with the Yellowstone.

Late season irrigation supplies are expected to be near average on Yellowstone River tributaries.







## STATIONS

## SNOW COURSES

## COLUMBIA RIVER BASIN

Drainage Basin & Course Name	Number	Elev.	Sec.	Twp.	Range	Record Began	Measuring Dates	Means, By 2/	Drainage Basin & Course Name	Number	Elev.	Sec.	Twp.	Range	Record Began	Measuring Dates	Means, By 2/
COLUMBIA RIVER BASIN																	
KOOTENAI RIVER																	
Bald Eagle Peak	15411	5700	6	27N	31W	1969	3,4,5	1	Bald Ridge	10005	7500	11	4N	10E	1961	3,4,5	1
Barfield Mountain	15408	5500	4	32N	30W	1969	1,2,3,4,5,5,6	1	Camp Soda	7890	2	8S	18E	1937	3,4,5,5,6	1	1
Barre Creek	15411	5600	36	28N	31W	1976	3,4,5	2	Cooke Station	9007	8150	19	9S	15E	1966	3,4,5	2
Barre Midway	15416	4600	31	28N	30W	1965	3,4,5	1	Creville Mountain	10005	8400	22	9S	9E	1935	3,4	2
Barre Trail	15415	4200	5	31N	30W	1969	3,4,5,5,6	2	Flahar Creek	9100	11	9S	14E	1966	1,2,3,4,5,5,6	1,2	1,2
Brick Creek	15416	5200	32	31N	30W	1969	1,2,3,4,5	1,2	Crisley Peak	9005	8400	26	7S	19E	1961	1,2,3,4,5,5,6	1,2
Brick Creek	15414	5000	12	31N	26W	1977	3,4,5	1	Independence	10006	7850	22	7S	12E	1940	3,4,5	1
Brick Creek	15413	4100	35	28N	31W	1969	1,2,3,4,5,5,6	1	Monument Peak	10012	8500	32	7S	12E	1961	3,4,5	1
Clatsop Trail	15406	6100	9	36N	29W	1969	1,2,3,4,5,5,6	1	Northwest Entrance	10003	6500	34	2N	16E	1960	1,2,3,4,5,5,6	1,6
Darby Creek	15404	5400	20	37N	30W	1969	3,4,5,5,6	1	Preception P.S.	10010	6550	34	2N	16E	1960	3,4,5	1
Darby Creek	15407	5250	18	37N	32W	1969	1,2,3,4,5,5,6	1	Snider Fort Shields	10048	8100	13	4N	10E	1966	3,4,5	1
Devine Creek	15405	4250	31	37N	32W	1969	1,2,3,4,5,5,6	1,2	Taberline Creek	9004	8850	10	8S	18E	1961	3,4,5	1
Graves Creek	14411	4300	1	36N	29W	1937	3,4,5	1	West Rosebud	9002	7500	9	7S	16E	1960	3,4	2
Graves Creek	15403	6550	18	37N	33W	1969	1,2,3,4,5,5,6	1	White Mill	9008	8700	18	9S	15E	1967	3,4,5	2
RUBY RIVER																	
Abundance Lake	13020	8800	7	3S	11W	1963	3,4,5	1	Abundance Lake	13020	8800	7	3S	11W	1963	3,4,5	1
Dorshara Lake	13019	8600	4	8S	16W	1963	3,4,5	1	Doberbra Lake	13019	8600	4	8S	16W	1963	3,4,5	1
Poolben	13021	8280	11	1S	13W	1963	3,4,5	1	Snider Fort Shields	10048	8100	13	4N	10E	1966	3,4,5	1
Palladed Lake	13023	8450	3	2N	15W	1967	3,4,5	1	Taberline Creek	9004	8850	10	8S	18E	1961	3,4,5	1
Slag-A-Melt Lake	13024	8750	29	5S	17W	1968	3,4,5	1	West Rosebud	9002	7500	9	7S	16E	1960	3,4	2
BIG HOLE RIVER																	
Abundance Lake	13020	8800	7	3S	11W	1963	3,4,5	1	Abundance Lake	13020	8800	7	3S	11W	1963	3,4,5	1
Dorshara Lake	13019	8600	4	8S	16W	1963	3,4,5	1	Doberbra Lake	13019	8600	4	8S	16W	1963	3,4,5	1
Poolben	13021	8280	11	1S	13W	1963	3,4,5	1	Snider Fort Shields	10048	8100	13	4N	10E	1966	3,4,5	1
Palladed Lake	13023	8450	3	2N	15W	1967	3,4,5	1	Taberline Creek	9004	8850	10	8S	18E	1961	3,4,5	1
Slag-A-Melt Lake	13024	8750	29	5S	17W	1968	3,4,5	1	West Rosebud	9002	7500	9	7S	16E	1960	3,4	2

## SOIL MOISTURE STATIONS

## COLUMBIA RIVER BASIN

13803	Big Creek	7	1942	1	1962	2M	1965	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962	1	1962
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## MISSOURI RIVER BASIN

10	Monthly	2W	14S	23	6700	11E13R	11E13R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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## MISSOURI RIVER BASIN

BEAVERHEAD RIVER									
13010	7600	12	86	164	1948	3,4,5	1		
12704	7000	22	86	74	1963	2,3,4,6	11		
13222	8400	24	128	134	1935	3,4,5	3		
13015	7800	21	48	129	1935	3,4,5	3		
13009	8100	11	86	164	1948	3,4,5	1		
11004	6930	26	148	50	1948	3,4,5	10		
11003	7400	27	148	50	1948	3,4,5	10		
11002	7400	27	148	50	1948	3,4,5	10		
11001	7400	27	148	50	1948	3,4,5	10		
13222	8100	2	108	154	1967	3,4	1		
13202	7900	15	168	154	1948	3,4	1		
12701	8850	18	148	50	1948	3,4,5	1		
JUDITH RIVER									
9002	7100	24	124	178	1966	3,4,5	1		
9001	6100	19	124	178	1966	3,4,5	1		
9003	5600	8	124	178	1966	3,4,5	1		
10006	8000	20	124	178	1966	3,4,5	1		
<p>1. U. S. Soil Conservation Service</p> <p>2. U. S. Forest Service</p> <p>3. U. S. Game and Fish Service</p> <p>4. Montana Power Company</p> <p>5. U. S. Indian Service</p> <p>6. U. S. National Park Service</p> <p>7. KSU Agricultural Experiment Station</p> <p>8. U. S. Bureau of Reclamation</p> <p>9. U. S. Bureau of Sport Fisheries and Wildlife</p> <p>10. U. S. Bureau of Land Management</p> <p>11. Private Cooperator</p> <p>12. Soil and Water Conservation District</p>									

1/ Numerals 1, 2, 3, 4, 5, 5½, 6 refer to January 1, February 1, March 1, April 1, May 1, May 15 and June 1.

2/ Numarals refer to Agency that makes the snow survey as follows:

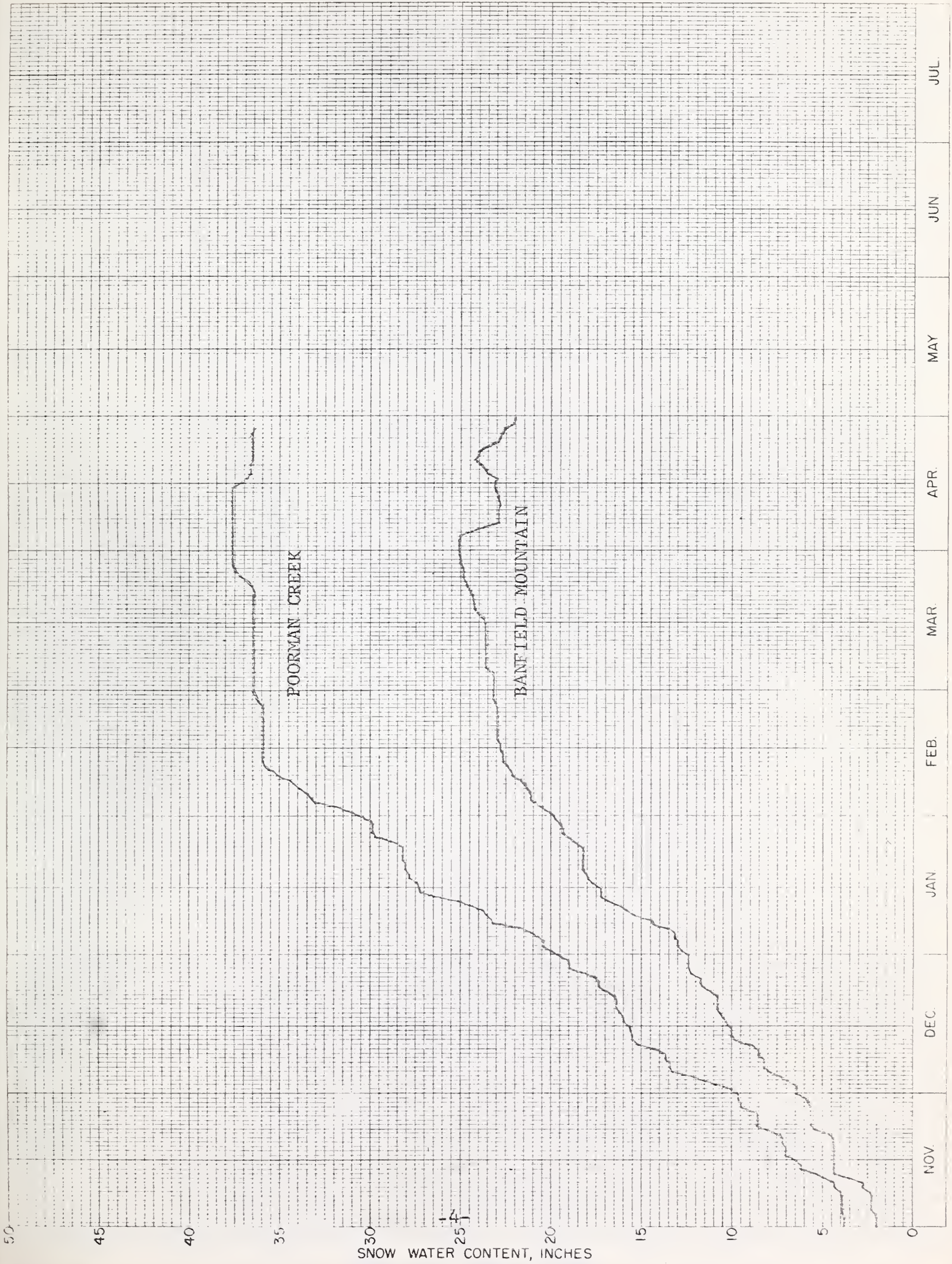
1. U. S. Soil Conservation Service
2. U. S. Forest Service
3. U. S. Geological Survey
4. Washington State Department of Ecology
5. U. S. Indian Service
6. U. S. National Park Service
7. U. S. Fish and Wildlife Service
8. U. S. Soil Conservation Service
9. U. S. Department of the Interior
10. U. S. Bureau of Sport Fisheries and Wildlife
11. Private Cooperator
12. Soil and Water Conservation District

## LEGEND



SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_ Elev. \_\_\_\_\_ Drainage: KOOTENAI

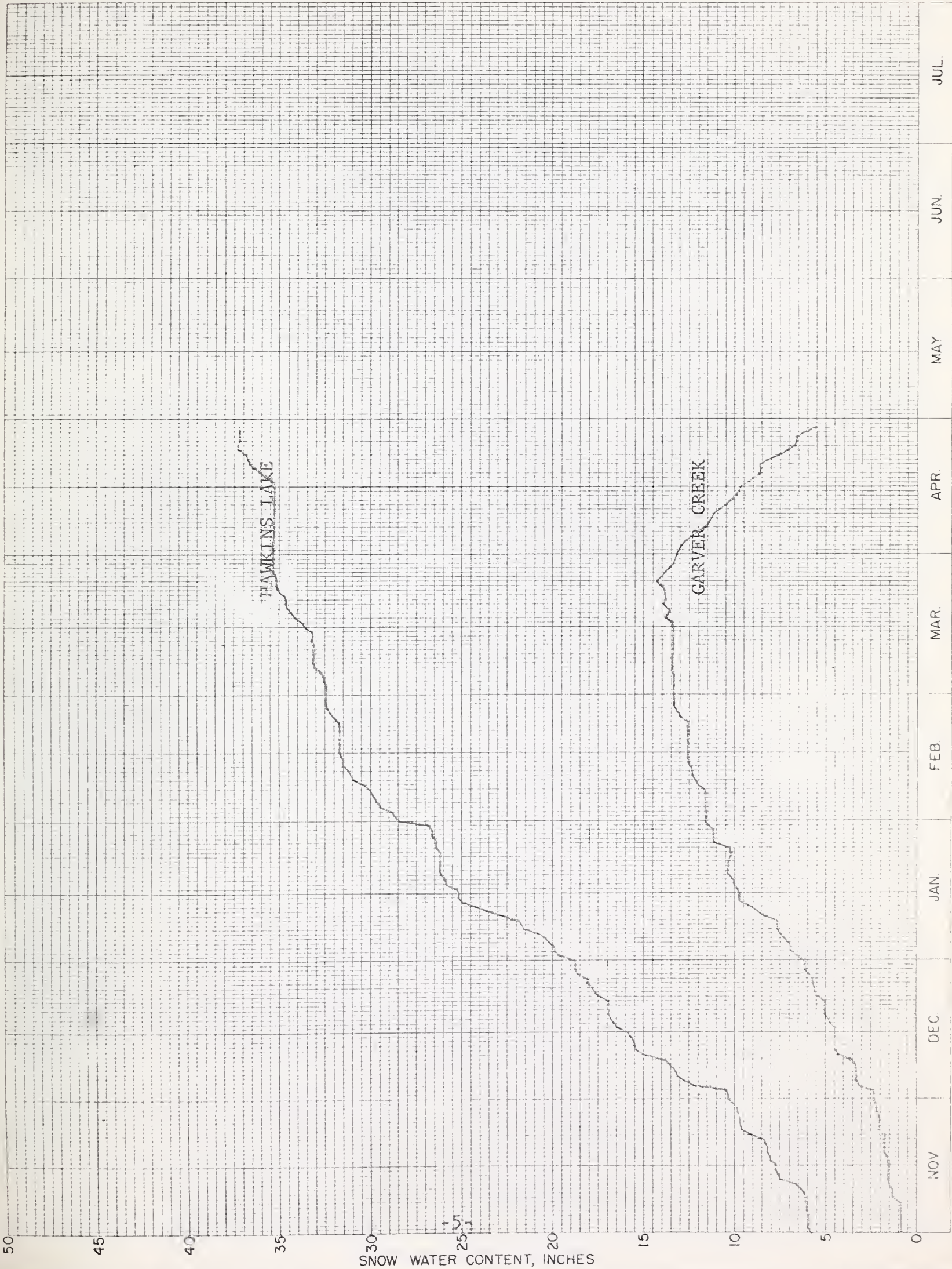






SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_ Elev. \_\_\_\_\_ Drainage: KOOTENAI







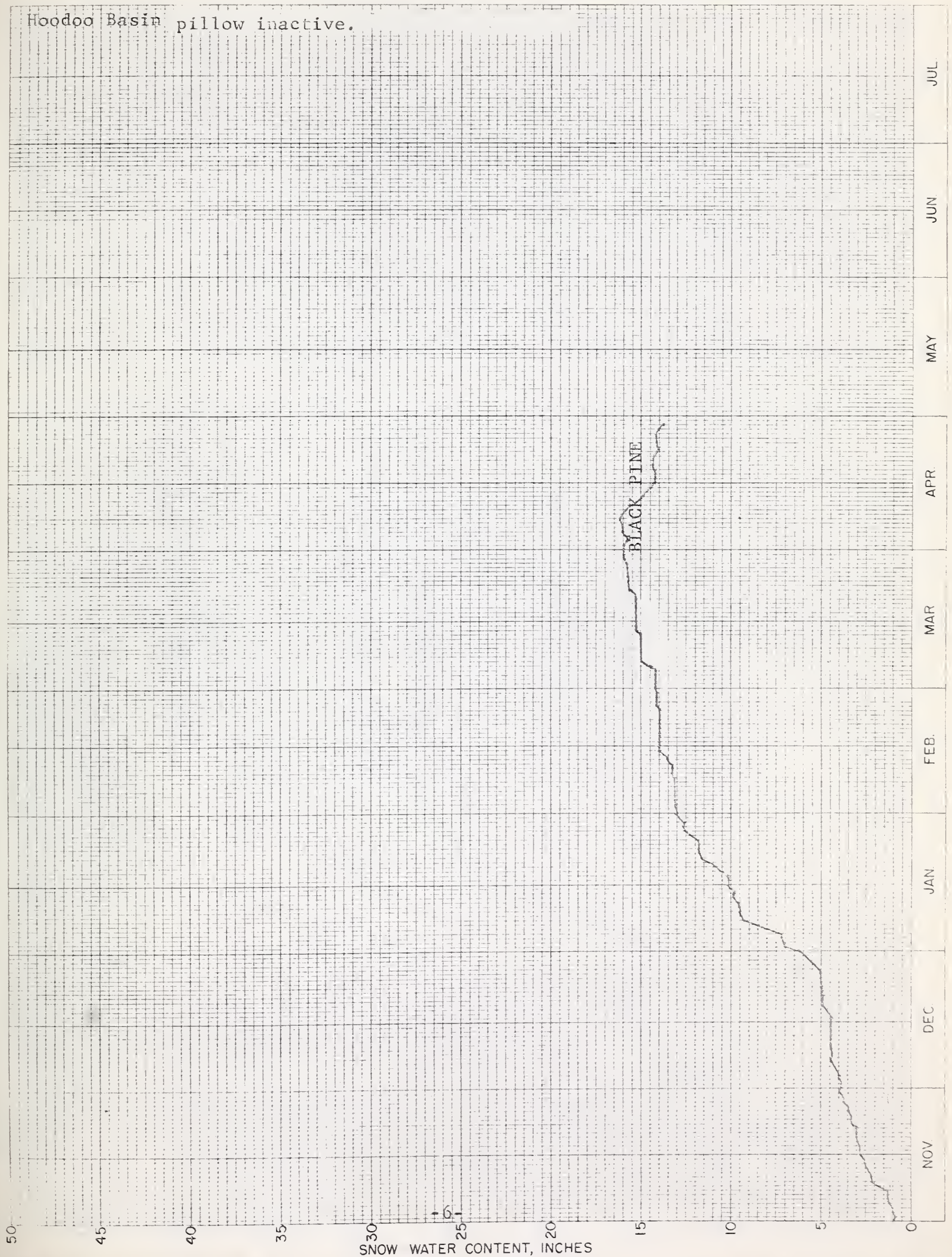
SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_

Elev. \_\_\_\_\_

Drainage: CLARK FORK

Hoodoo Basin pillow inactive.



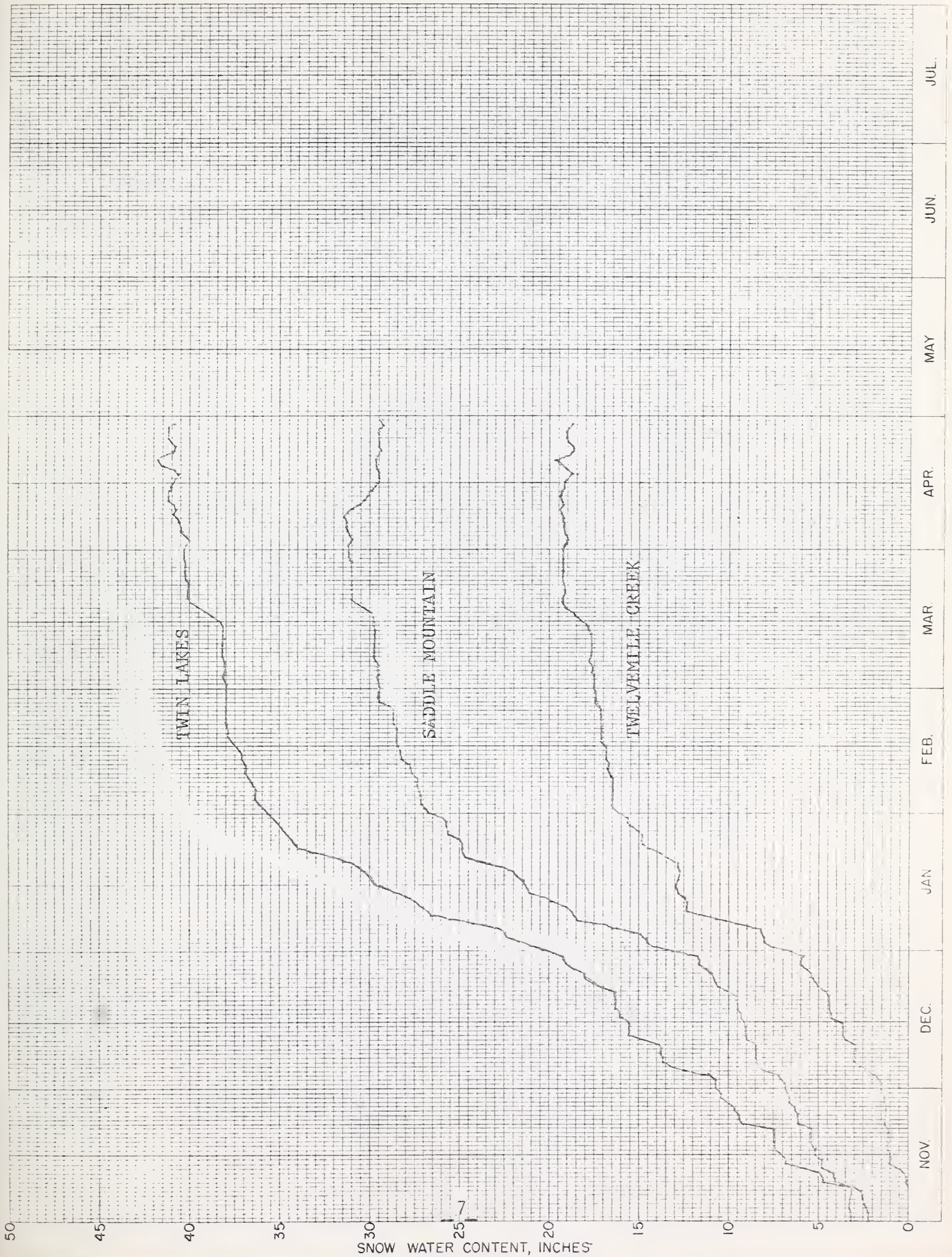
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# SNOW PILLOW DATA

## WATER YEAR 1969

No. \_\_\_\_\_ Elev. \_\_\_\_\_ Drainage: BITTERROOT





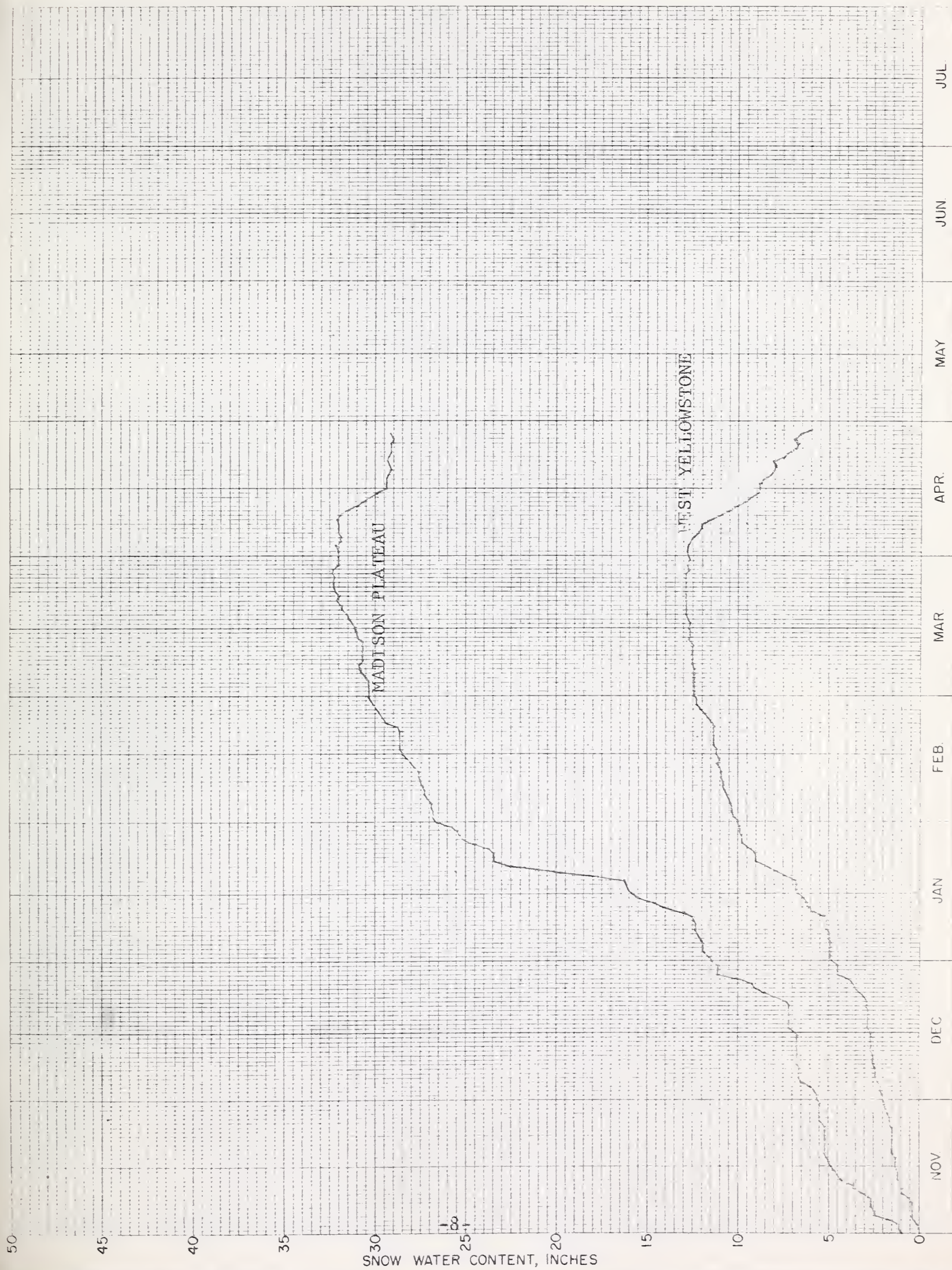


SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_

Elev. \_\_\_\_\_

Drainage: MADISON

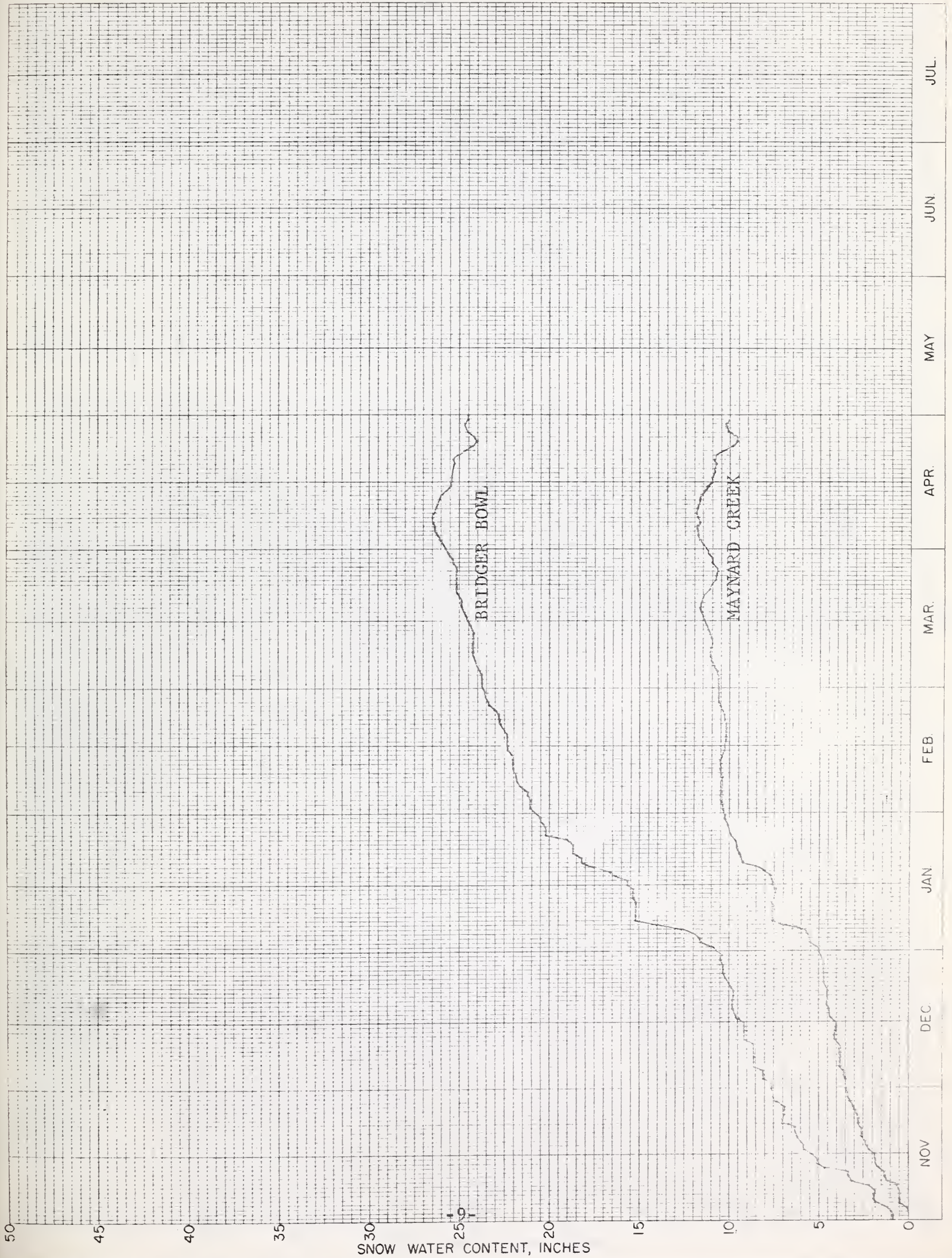






SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_ Elev. \_\_\_\_\_ Drainage: GALLATIN







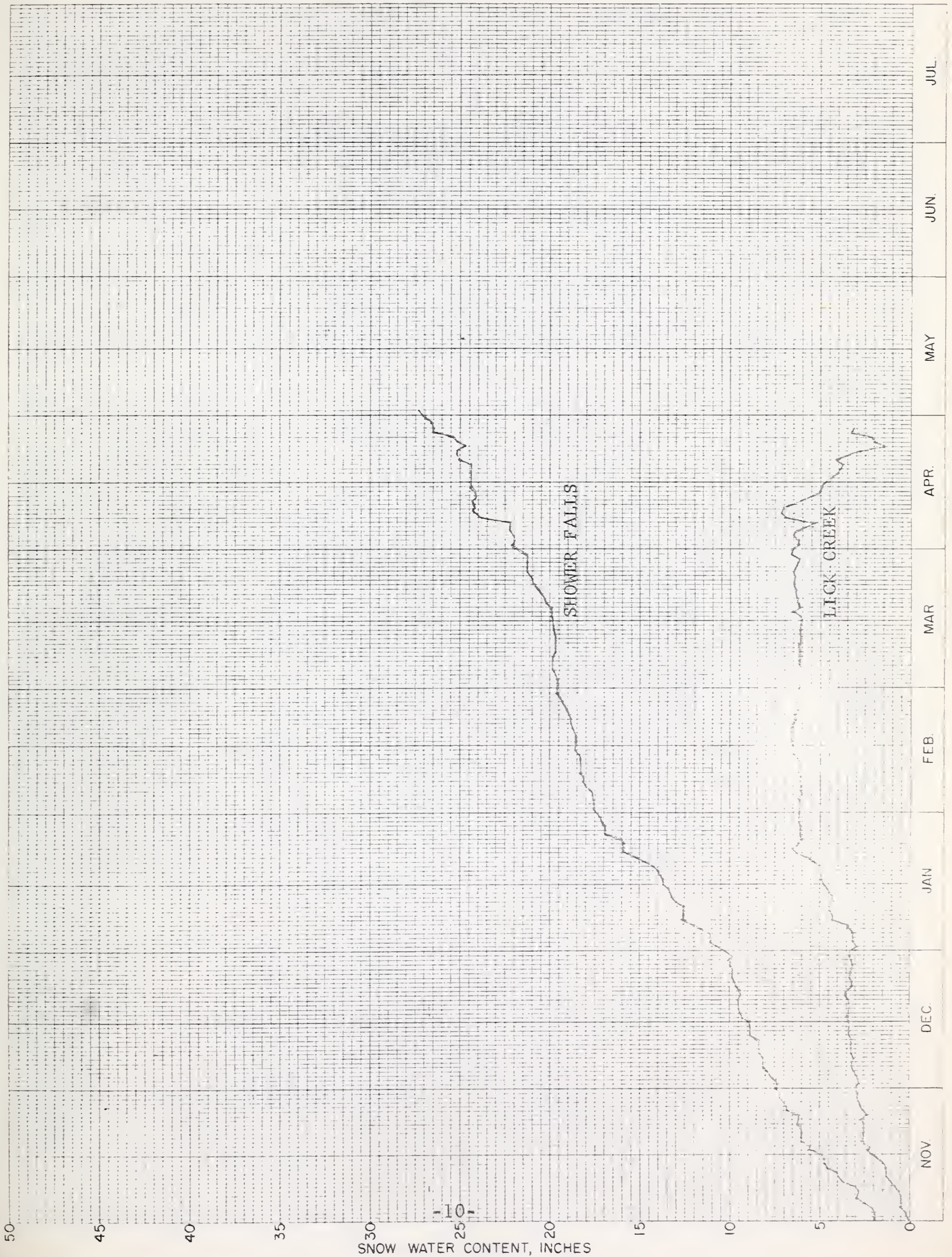
SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_

Elev. \_\_\_\_\_

Drainage: \_\_\_\_\_

GALLATIN

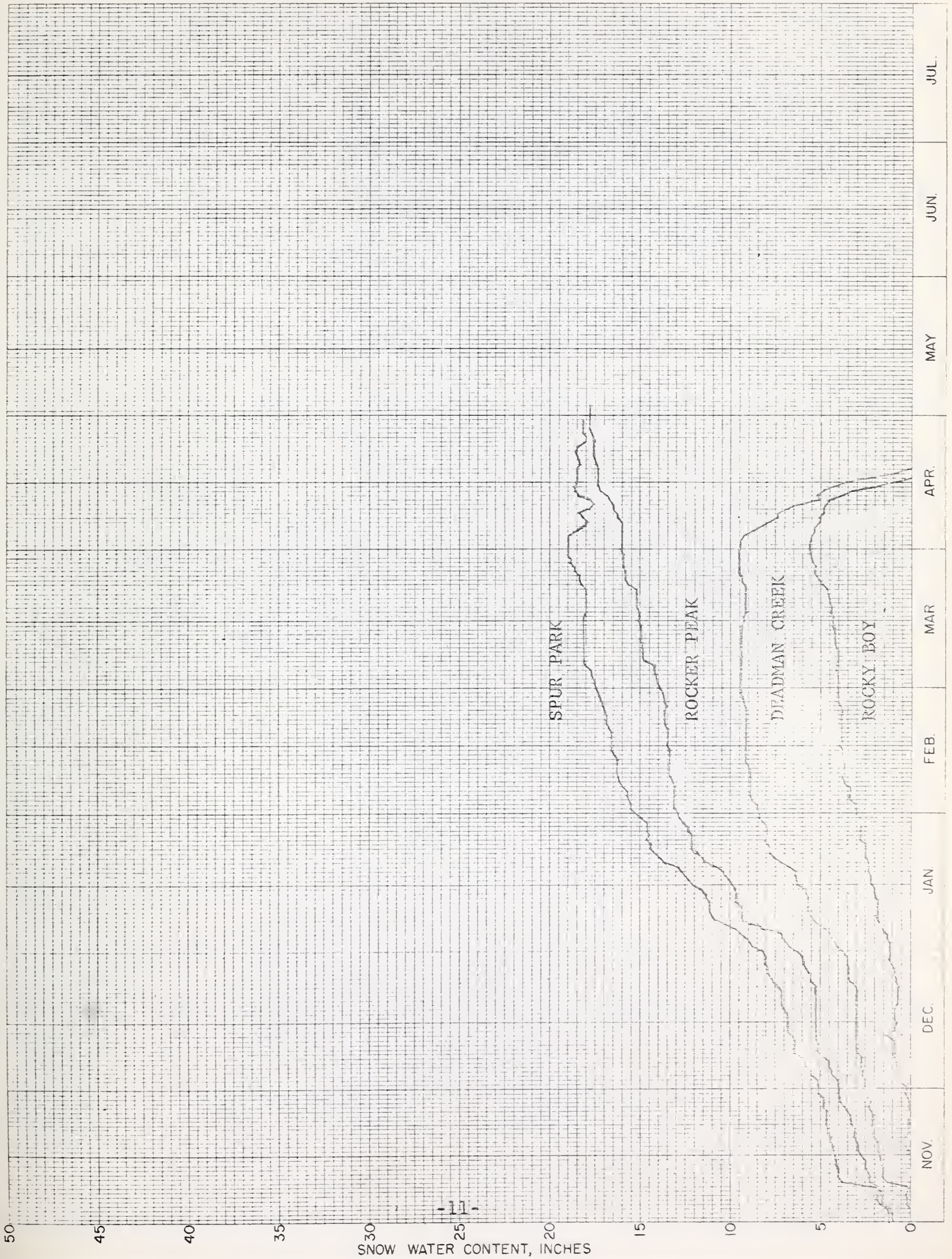






SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_ Elev. \_\_\_\_\_ Drainage: JUDITH-JEFFERSON-MISSOURI





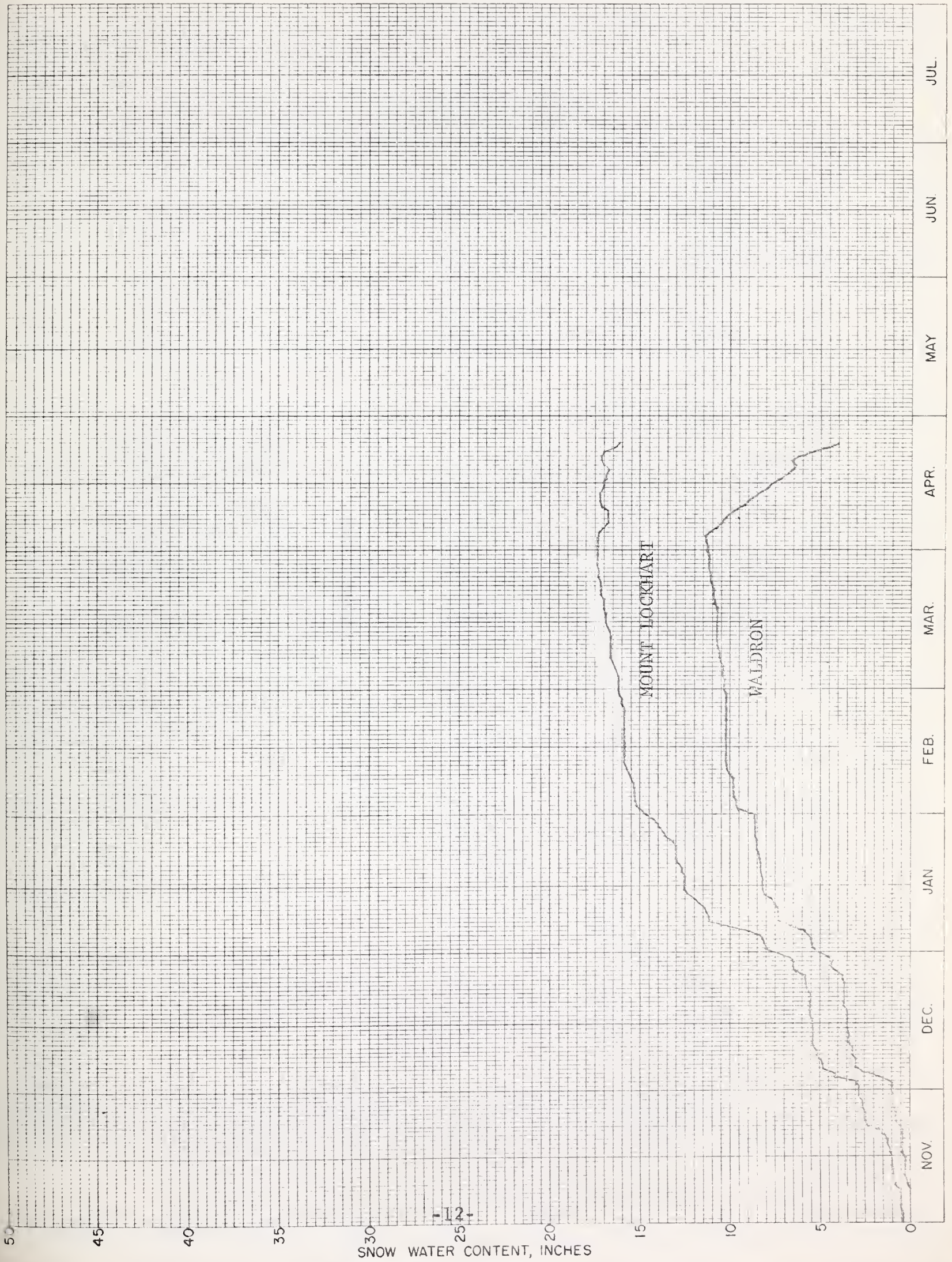


SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_

Elev. \_\_\_\_\_

Drainage: SUN

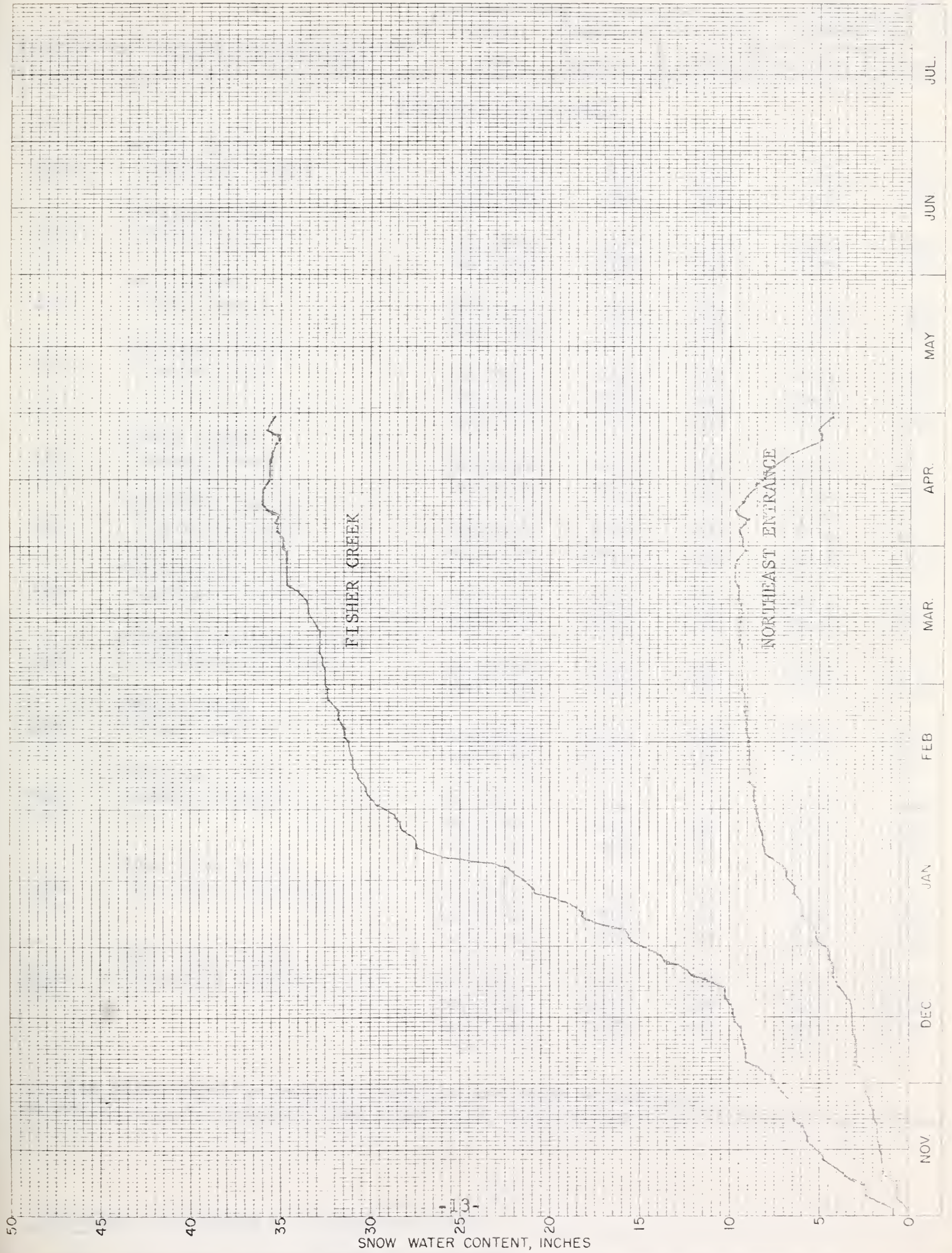






SNOW PILLOW DATA  
WATER YEAR 1969

No. \_\_\_\_\_ Elev. \_\_\_\_\_ Drainage: YELLOWSTONE



SNOW WATER CONTENT, INCHES





# WATER SUPPLY FORECASTS

AS OF MAY 1, 1969

(1000 Acre Feet)

		FORECAST	FORECAST	PERCENT	(1000 Acre Feet)	
NO.	RIVER AND FORECAST POINT	PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
COLUMBIA RIVER BASIN						
3020	FISHER RIVER Jennings (near)	May-Sept May-July	220 205	103 103	146 127	214 199
3030	KOOTENAI RIVER Libby (at)	May-Sept May-July	7350 6300	99 99	6669 5589	7444 6375
3045	YAAK RIVER Troy (near)	May-Sept May-July	460 435	100 100	360 327	458 434
3050	KOOTENAI RIVER Leonía (at)	May-Sept May-July May-June	8400 7280 5670	100 100 100	7481 6287 4772	8397 7271 5662
3235	GERMAN GULCH Ramsay (near)	May-Sept May-July	13.5 12.9	122 122	11.6 10.1	11.1 10.5
3241	RACETRACK CREEK Anaconda (near)	May-Sept May-July	35.6 28.5	110 110	35.0 25.9	32.5 26.0
3301	FLINT CREEK Boulder Creek (below) (3)	May-Sept May-July	68.5 52.0	110 110	68.9 48.6	62.4 47.9
3320	MIDDLE FORK ROCK CREEK Philipsburg (near)	May-Sept May-July	74.5 67.0	107 107	66.5 57.2	69.7 62.4
3355	NEVADA CREEK Finn (near)	May-Sept May-July	20.5 18.7	120 120	13.3 11.2	17.0 15.6
3400	BLACKFOOT RIVER Bonner (near)	May-Sept May-July May-June	910 810 685	101 101 101	618 523 438	896 801 676
3404	CLARK FORK RIVER Milltown (above) (4)	May-Sept May-July May-June	710 605 500	109 109 109	659 516 428	651 555 458
3405	CLARK FORK RIVER Missoula (above)	May-Sept May-July May-June	1620 1405 1185	104 104 104	1277 1039 866	1547 1356 1134

(3) Sum Flint Creek at Maxville and Boulder Creek at Maxville.

(4) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.



# WATER SUPPLY FORECASTS

AS OF MAY 1, 1969

					(1000 Acre Feet)	
NO.	RIVER AND FORECAST POINT	FORECAST	FORECAST	PERCENT	MEASURED FLOW	
		PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
	WEST FORK BITTERROOT RIVER					
3425	Conner (near)(5)	May-Sept	150	99	147	152
		May-July	138	99	133	140
	EAST FORK BITTERROOT RIVER					
3434	Conner (near)	May-Sept	152	97	150	157
		May-July	136	97	132	141
	BITTERROOT RIVER					
3440	Darby (near)	May-Sept	505	100	502	503
		May-July	464	100	452	462
		May-June	401	100	391	399
	SKALKAHO CREEK					
3465	Hamilton (near)	May-Sept	57.5	109	48.4	52.9
		May-July	50.0	109	40.6	46.0
	BLODGETT CREEK					
3475	Corvallis (near)	May-Sept	38.5	99	39.2	38.8
		May-July	36.4	99	33.6	36.8
	BITTERROOT RIVER					
3528	Missoula (at)(6)	May-Sept	1305	99	1305	1319
		May-July	1200	99	1127	1212
		May-June	1020	99	956	1028
	CLARK FORK RIVER					
3530	Missoula (below)	May-Sept	2925	102	2582	2866
		May-July	2615	102	2166	2569
		May-June	2205	102	1822	2162
	ST. REGIS RIVER					
3540	St. Regis (near)	May-Sept	280	108	183	258
		May-July	262	108	164	242
	CLARK FORK RIVER					
3545	St. Regis (at)	May-Sept	4085	106	3311	3855
		May-July	3690	106	2788	3449
		May-June	3080	106	2328	2908
	NORTH FORK FLATHEAD RIVER					
3555	Columbia Falls (near)	May-Sept	1910	103	1586	1857
		May-July	1730	103	1371	1680
		May-June	1440	103	1135	1396
	MIDDLE FORK FLATHEAD RIVER					
3585	West Glacier (near)	May-Sept	1640	93	1581	1764
		May-July	1510	93	1338	1624
		May-June	1260	93	1113	1355
	SOUTH FORK FLATHEAD RIVER					
3625	Columbia Falls (near)(7)	May-Sept	2080	99	1927	2109
		May-July	1960	99	1660	1986
		May-June	1700	99	1438	1718

(5) Adjusted for storage in Painted Rocks Reservoir.

(6) Difference in observed flow Clark Fork above and below Missoula.

(7) Adjusted for storage in Hungry Horse Reservoir.





# WATER SUPPLY FORECASTS

AS OF MAY 1, 1969

					(1000 Acre Feet)	
NO.	RIVER AND FORECAST POINT	FORECAST	FORECAST	PERCENT	MEASURED FLOW	
		PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
	FLATHEAD RIVER					
3630	Columbia Falls (at)(7)	May-Sept	5750	98	5168	5867
		May-July	5300	98	4440	5403
		May-June	4460	98	3750	4556
	SWAN RIVER					
3700	Big Fork (near)	May-Sept	580	97	579	597
		May-July	500	97	458	516
		May-June	390	97	347	405
	FLATHEAD RIVER					
3720	Polson (near)(8)	May-Sept	7030	101	6041	6930
		May-July	6480	101	5107	6384
		May-June	5420	101	4279	5351
	CLARK FORK RIVER					
3890	Plains (near)(8)	May-Sept	11570	104	9665	11127
		May-July	10500	104	8118	10093
		May-June	8650	104	6747	8447
	THOMPSON RIVER					
3895	Thompson Falls (near)	May-Sept	250	106	156	235
		May-July	218	106	127	205
	PROSPECT CREEK					
3907	Thompson Falls (at)	May-Sept	128	108	86.3	118
		May-July	118	108	77.2	109
	CLARK FORK RIVER					
3920	Whitehorse Rapids (at)(9)	May-Sept	12840	105	10684	12313
		May-July	11600	105	9031	11112
		May-June	9700	105	7472	9278

(7) Adjusted for storage in Hungry Horse Reservoir.

(8) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.

(9) Adjusted for storage in Hungry Horse, Flathead Lake and Noxon Rapids Reservoirs.





# WATER SUPPLY FORECASTS

AS OF MAY 1, 1969

		(1000 Acre Feet)				
NO.	RIVER AND FORECAST POINT	FORECAST	FORECAST	PERCENT	MEASURED FLOW	
		PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
MISSOURI RIVER BASIN						
0125	RED ROCK RIVER Monida (near)(11)	May-Sept	105	182	89.2	57.9
		May-July	96.5	182	80.0	53.0
0154	BEAVERHEAD RIVER Armstead (near)(11)(12)	May-Sept	140	196	108.1	71.5
		May-July	109	196	78.3	55.5
0195	RUBY RIVER Alder (near)	May-Sept	90.0	126	92.0	71.6
		May-July	73.8	126	74.2	58.6
0255	BIG HOLE RIVER Melrose (near)	May-Sept	710	116	629	611
		May-July	655	116	549	563
0260	BIRCH CREEK Glen (near)	May-Sept	14.2	114	14.7	12.4
		May-July	11.7	114	12.1	10.3
0330	BOULDER RIVER Boulder (near)	May-Sept	95.0	134	94.9	71.0
		May-July	90.0	134	87.0	67.6
0345	JEFFERSON RIVER Sappington (at)(12)	May-Sept	1095	135	879	817
		May-July	980	135	728	725
0350	WILLOW CREEK Harrison (near)	May-Sept	19.0	140	17.2	13.5
		May-July	17.2	140	14.7	12.3
0375	MADISON RIVER West Yellowstone (near)	May-Sept	240	130	217	184
		May-July	173	130	154	133
0385	MADISON RIVER Grayling (near)(13)	May-Sept	520	138	469	376
		May-July	393	138	337	284
0410	MADISON RIVER McAllister (near)(14)	May-Sept	850	134	822	637
		May-July	650	134	605	485
0435	GALLATIN RIVER Gateway (near)	May-Sept	520	118	615	440
		May-July	434	118	507	367
0485	BRIDGER CREEK Bozeman (near)	May-Sept	16.4	94	37.9	17.5
		May-July	15.2	94	33.8	16.2

(11) Adjusted for storage in Lima Reservoir.

(12) Adjusted for storage in Clark Canyon Reservoir.

(13) Adjusted for storage in Hebgen Lake.

(14) Adjusted for storage in Hebgen and Ennis Lakes.





# WATER SUPPLY FORECASTS

AS OF MAY 1, 1969

		(1000 Acre Feet)				
NO.	RIVER AND FORECAST POINT	FORECAST	FORECAST	PERCENT	MEASURED FLOW	
		PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
	HYALITE CREEK					
0500	Bozeman (near)(15)	May-Sept	33.0	95	53.9	34.9
		May-July	28.5	95	43.1	30.0
	GALLATIN RIVER					
0525	Logan (at)	May-Sept	495	120	717	413
		May-July	410	120	579	341
	MISSOURI RIVER					
0545	Toston (at)(16)	May-Sept	2360	130	2465	1810
		May-July	2000	130	1981	1540
	PRICKLY PEAR CREEK					
0615	Clancy (near)	May-Sept	26.0	134	23.6	19.4
		May-July	22.1	134	17.0	16.5
	LITTLE PRICKLY PEAR CREEK					
0711	Sieben Ranch (at)	May-Sept	30.5	128		23.7
		May-July	25.3	128		19.7
	DEARBORN RIVER					
0735	Craig (near)	May-Sept	100	81	58.3	124
		May-July	94.0	81	51.3	117
	SHEEP CREEK					
0770	W. Sulphur Springs (near)	May-Sept	14.5	83	26.3	17.5
		May-July	12.4	83	22.9	15.0
	SMITH RIVER					
0775	Eden (near)	May-Sept	130	82	317	159
		May-July	119	82	277	145
	SUN RIVER					
0786	Gibson Dam (at)(17)	May-Sept	475	83	409	574
		May-July	435	83	360	525
	BELT CREEK					
0905	Monarch (near)	May-Sept	90.0	87	192	103
		May-July	80.0	87	174	93.9
	MISSOURI RIVER					
0908	Fort Benton (at)(18)	May-Sept	3230	110	3546	2915
		May-July	2670	110	2761	2428
	TWO MEDICINE CREEK					
0920	Browning (near)(19)	May-Sept	180	79	180	229
		May-July	174	79	157	218
	BADGER CREEK					
0925	Browning (near)	May-Sept	100	82	95.8	122
		May-July	86.0	82	77.3	105
	CUT BANK CREEK					
0990	Cut Bank (at)	May-Sept	74.0	71	84.1	105
		May-July	67.5	71	68.5	95.5

(15) Adjusted for storage in Middle Creek Reservoir.

(16) Adjusted for storage in Hebgen and Ennis Lakes and Clark Canyon Reservoir.

(17) Adjusted for storage in Gibson Reservoir and diversions.

(18) Adjusted for storage in Canyon Ferry Reservoir.

(19) Adjusted for storage in Two Medicine Res. & diversions into Two Medicine Canal.





# WATER SUPPLY FORECASTS

AS OF MAY 1, 1969

		(1000 Acre Feet)				
NO.	RIVER AND FORECAST POINT	FORECAST	FORECAST	PERCENT	MEASURED FLOW	
		PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
MARIAS RIVER						
0995	Shelby (near)(20)	May-Sept	380	72	345	532
		May-July	364	72	294	509
MISSOURI RIVER						
1095	Virgelle (at)(21)	May-Sept	3700	104	4004	3554
		May-July	3150	104	3109	3029
S. FORK JUDITH RIVER						
1098	Utica (near)	May-Sept	11.0	95	11.8	11.6
		May-July	10.3	95	10.5	10.8
MISSOURI RIVER						
1152	Landusky (near)(21)	May-Sept	4120	104	4051	3941
		May-July	3480	104	3090	3346
N. FORK MUSSELSHELL RIVER						
1155	Delpine (near)	May-Sept	4.4	94	6.6	4.7
		May-July	3.6	95	5.1	3.8
S. FORK MUSSELSHELL RIVER						
1185	Martinsdale (above)	May-Sept	40.0	96	49.3	41.8
		May-July	38.0	96	45.0	39.6
MISSOURI RIVER						
1320	Ft. Peck Dam (below)(22)	May-Sept	3820	103	4378	3713
		May-July	3320	103	3479	3225
MILK RIVER						
1350	Eastern Crossing (at)	May-Sept	212	97	248	220
MISSOURI RIVER						
1770	Wolf Point (near)(22)	May-Sept	4000	102	4360	3939
		May-July	3480	102	3443	3423
MISSOURI RIVER						
3300	Williston, N.D. (nr)(29)	May-Sept	9200	95	11668	9625
		May-July	7830	95	9192	8227

## SASKATCHEWAN RIVER BASIN

ST. MARY RIVER						
0175	Babb (near)(30)	May-Sept	470	100	445	472
		May-July	405	100	352	407

- (20) Adjusted for storage in Two Medicine, Four Horns, Lake Frances and Swift Reservoirs.
- (21) Adjusted for storage in Canyon Ferry and Tiber Reservoirs.
- (22) Adjusted for storage in Canyon Ferry, Tiber and Fort Peck Reservoirs.
- (29) Adjusted for storage in Canyon Ferry, Tiber, Fort Peck, Buffalo Bill, Boysen and Yellowtail Reservoirs. Sum Yellowstone River near Sidney and Missouri River near Culbertson.
- (30) Adjusted for storage in Lake Sherburne.





# WATER SUPPLY FORECASTS

AS OF MAY 1, 1969

		(1000 Acre Feet)				
NO.	RIVER AND FORECAST POINT	FORECAST	FORECAST	PERCENT	MEASURED FLOW	
		PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
YELLOWSTONE RIVER BASIN						
	YELLOWSTONE RIVER					
1915	Corwin Springs (at)	May-Sept	1810	100	2037	1804
		May-July	1500	100	1560	1498
	YELLOWSTONE RIVER					
1925	Livingston (near)	May-Sept	2030	100	2494	2025
		May-July	1680	100	1942	1672
	SHIELDS RIVER					
1935	Clyde Park (at)	Streamflow measurement discontinued				
	BOULDER RIVER					
2000	Big Timber (at)	May-Sept	343	102	471	337
		May-July	322	102	395	316
	STILLWATER RIVER					
2050	Absarokee (near)(25)	May-Sept	495	92	633	538
		May-July	420	92	493	455
	CLARKS FORK RIVER					
2075	Chance (at)	May-Sept	540	96	555	561
		May-July	490	96	460	510
	CLARKS FORK RIVER					
2085	Edgar (at)	May-Sept	560	96	592	583
		May-July	495	96	461	517
	ROCK CREEK					
2095	Red Lodge (near)	May-Sept	99.5	96	99.1	104
		May-July	76.4	96	70.5	79.9
	YELLOWSTONE RIVER					
2145	Billings (at)	May-Sept	3620	98	4681	3726
		May-July	3110	98	3668	3182
	BIG HORN RIVER					
2870	St. Xavier (near)(26)	May-Sept	1375	86	1999	1599
		May-July	1290	86	1594	1503
	LITTLE BIG HORN RIVER					
2920	Lodgegrass (near)(28)	May-Sept	80.0	72	183	111
		May-July	70.0	72	154	97.4
	YELLOWSTONE RIVER					
3090	Miles City (at)(27)	May-Sept	5060	93	6985	5434
		May-July	4420	93	5557	4761
	YELLOWSTONE RIVER					
3295	Sidney (near)(27)	May-Sept	5050	91	7300	5572
		May-July	4500	91	5743	4958

(25) Adjusted for storage in Mystic Lake.

(26) Adjusted for storage in Buffalo Bill, Boysen, Bull Lake & Yellowtail Reservoirs.

(27) Adjusted for storage in Buffalo Bill, Boysen and Yellowtail Reservoirs.

(28) Sum Little Big Horn below Pass Creek and Lodgegrass Creek near Wyola.



# SNOW SURVEY DATA

AS OF MAY 1, 1969

(Inches)

[illegible]

## COLUMBIA RIVER BASIN

## KOOTENAI RIVER

15A11	Bald Eagle Peak	5700	4/28	129	66.6	-	-
15A08	Banfield Mountain	5600	5/1	46	24.1	-	-
15B11	Baree Creek	5500	5/2	96	40.2	40.4	48.4
15B16	Baree Midway	4600	5/2	66	32.9	27.2	-
15B15	Baree Trail	3800	5/2	0	0.0	0.0	1.0*
16A08	Bear Mountain	5400	4/30	142	69.7	-	-
15A10	Bristow Creek	3900	5/1	0	0.0	-	-
14A04	Brush Creek	5000	4/29	16	6.6	8.3	10.7
14A13	Brush Creek Timber	5000	4/29	11	4.6	5.6	9.4*
15A13	Cedar Grove	4100	4/28	4	2.3	-	-
15A04	Davis Creek	5400	4/29	43	21.9	-	-
BC 10	Fernie	3500	No Measurement			0.0	3.0
BC 12A	Field	4200	4/29	0	0.0	3.8	1.0*
15A05	Garver Creek	4250	4/29	9	4.4	-	-
BC 11	Glacier	4100	4/29	51	25.6	32.5	28.3
14A11	Graves Creek	4300	5/2	28	13.9	12.3	16.8*
BC 43	Gray Creek	5100	4/28	47	16.9	20.3	21.0
16A07	Halverson Creek	4850	4/30	108	52.7	-	-
15A03	Hawkins Lake	6450	4/29	83	39.4	-	-
16A09	Keeler Creek	3300	4/30	0	0.0	-	-
BC 33	Kicking Horse	5400	4/30	31	10.4	15.4	14.5
BC 20B	Kimberley	3800	4/29	0	0.0	0.0	8.5*
15A09	Lost Soul	4800	5/1	11	5.3	-	-
BC 32	Marble Canyon	5000	4/29	21	8.8	11.3	12.8
BC 10B	Morrissey Ridge	6100	5/1	60	26.7	27.2	28.8*
BC 10A	New Fernie	4100	No Measurement			8.0	7.3
15A12	Poorman Creek	5100	4/28	69	35.9	-	-
15A01	Red Mountain	6000	4/30	46	20.3	18.4	21.0
BC 8A	Sinclair Pass	4500	4/29	0	0.0	6.0	2.3
14A12	Stahl Peak	6050	5/2	98	45.0	-	-
BC 20A	Sullivan Mine	5100	4/30	32	12.6	11.1	13.1
BC 41	Upper Elk River	4400	4/27	0	0.0	0.0	2.2*
14A07	Weasel Divide	5450	5/2	72	33.3	32.9	36.6

*Note: All Averages Based on 1953-67, 15 year period. \*Adjusted Average*





# SNOW SURVEY DATA

AS OF MAY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

## FLATHEAD RIVER

14B03	Bassoo Peak	5150	4/28	11	4.9	6.2	8.3*
13A11	Beaver Lake	5900	5/4	40	18.6	21.8	26.6*
13B03	Big Creek	6750	4/30	98	47.4	47.6	51.7
13A17	Camp Misery	6400	4/30	112	47.6	43.9	50.5*
13A02	Desert Mountain	5600	5/1	22	9.3	12.3	15.1
13B04	Fatty Creek	5500	4/30	44	18.5	22.2	23.2*
14A09	Griffin Creek Divide	5150	4/28	12	5.0	6.4	8.1*
13B12	Gunsight Lake	6300	5/4	72	37.8	41.3	44.5*
14A03	Hell Roaring Divide	5770	4/30	60	28.1	26.0	33.5
13B13	Holbrook	4530	5/4	0	0.0	0.0	1.8
14A05	Logan Creek	4300	4/29	0	0.0	0.0	3.5
13A05	Marias Pass	5250	4/28	25	11.6	13.2	18.7
13A16	Mineral Creek	4000	4/29	17	7.7	7.1	15.3*
13B07	North Fork Jocko	6330	5/1	79	39.8	43.8	49.1
13B02	Spotted Bear Mountain	7000	5/4	0	0.0	9.4	12.2
13B01	Trinkus Lake	6100	5/4	74	37.2	45.4	47.1
13B11	Twin Creeks	3580	5/4	0	0.0	0.0	1.8
13B05	Upper Holland Lake	6200	5/4	65	39.2	39.1	39.7

## CLARK FORK RIVER

13C13	Black Pine	7100	4/28	29	13.0	14.2	15.3*
13C13	Black Pine Pillow	7100	4/28	SP	13.8	15.4	-
12B10	Copper Creek	5700	5/2	6	3.0	2.0	11.0*
12B11	Cotter Mine	6250	5/2	33	15.2	8.9	16.3*
13B10	Coyote Hill	4200	4/30	0	0.0	0.0	2.9
13C11	Fred Burr Pass	8000	4/29	70	29.4	34.8	29.6*
14C10	Heart Lake Trail	4800	5/1	35	15.0	12.0	17.2*
15C10	Hoodoo Basin	6000	5/1	103	51.2	47.7	-
15C01	Hoodoo Creek	5900	5/1	103	49.2	43.0	52.0*
13C04	Intergaard	6450	5/1	21	7.4	9.4	7.8*
15B02	Lookout	5250	5/1	79	37.4	28.2	36.7
13C21	Lubrecht Forest No. 3	5450	5/3	4	2.0	2.6	3.1*
13C22	Lubrecht Forest No. 4	4650	5/3	0	0.0	0.0	0.2*
13C08	Lubrecht Forest No. 6	4040	5/3	0	0.0	0.0	0.0*
13C12	Red Lion	7100	4/29	44	16.0	22.0	18.0*
13C03	Skalkaho Summit	7260	5/1	52	25.0	25.6	27.3*
13C02	Slide Rock Mountain	7100	4/30	34	14.6	15.4	16.5*
13C07	Storm Lake	7780	4/29	39	14.4	19.0	16.6*
14B01	TV Mountain	6800	5/3	44	21.3	20.1	20.0*

SP - Snow pillow observation - water content only.





# SNOW SURVEY DATA

AS OF MAY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

## BITTERROOT RIVER

13C16	Ambrose	6480	4/29	23	9.4	11.2	13.2*
13C32	Coyote Meadows Trail	7000	4/25	39	17.4	-	-
13D02	Gibbons Pass	7100	4/29	48	21.6	22.8	23.1
14C05	Lolo Pass	5230	4/28	47	23.7	28.0	32.7*
14C07	Lost Horse	5940	4/28	64	29.7	30.5	34.0*
13D16	Moose Creek	6200	4/29	29	10.9	15.7	12.3*
14D02	Nez Perce Camp	5680	4/28	12	5.2	7.9	11.7
14D01	Nez Perce Pass	6570	4/28	20	9.6	15.6	13.9
13D22	Saddle Mountain	7940	4/29	66	28.6	29.6	28.0*
13D22	Saddle Mountain Pillow	7940	4/29	SP	29.4	26.8	-
14C04	Savage Pass	6600	4/27	50	24.3	28.6	-
14C13	Twelvemile Creek	5600	4/28	17	7.1	10.9	-
14C13	Twelvemile Creek Pillow	5600	4/28	SP	18.7	7.5	-
14C08	Twin Lakes	6510	4/28	79	38.8	43.4	48.0*
14C12	Twin Lakes Pillow	6400	4/28	SP	41.1	40.0	-

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# SNOW SURVEY DATA

AS OF MAY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

## MISSOURI RIVER BASIN

### BEAVERHEAD RIVER

13D10	Bloody Dick	7600	4/30	23	9.2	9.4	11.0*
12E03	Camp Creek	6800	5/2	25	11.6	-	-
13E22	Dad Creek Lake	8400	4/27	50	16.1	15.5	14.2*
13D15	Elk Horn Springs	7800	4/30	20	6.8	8.7	9.2
13D09	Gold Stone	8100	4/30	38	15.0	15.6	16.0*
11E04	Lakeview Canyon	6930	5/1	47	20.4	12.3	10.7*
11E03	Lakeview Ridge	7400	5/1	29	12.5	9.4	9.0*
11E32	Sawtelle Mountain	8715	4/29	91	44.8	31.7	-
12E01	White Pine Ridge	8850	4/27	15	3.1	7.4	6.5*

### RUBY RIVER

11D14	Branham Lakes	8850	4/27	75	33.6	35.8	-
11D08	Clover Meadow	8600	4/27	53	18.8	21.8	17.6*
12E07	Divide	7900	4/27	35	11.8	10.5	9.0*
11D15	Middle Mill Creek	7850	4/27	38	15.8	18.4	-
12E06	Notch	8500	4/27	53	18.4	16.8	15.0*
12D05	Smuggler Mine	6960	4/27	28	9.9	11.0	-

### BIG HOLE RIVER

13D20	Abundance Lake	8800	4/27	53	21.0	24.4	22.0*
13D19	Darkhorse Lake	8600	4/27	66	27.6	31.5	29.2*
13D21	Foolhen	8280	4/27	47	19.2	20.0	19.1*
13D25	Palisade Creek	8250	5/1	67	32.7	36.5	-
13D24	Slag-A-Melt Lake	8750	4/27	63	27.0	29.0	-

### JEFFERSON RIVER

12C07	Berry Meadow	7300	4/28	17	6.6	8.6	8.0*
12C09	Copper Mountain	7700	5/1	29	9.6	14.3	-
12D01	Pipestone Pass	7200	5/2	16	5.0	4.8	5.6
12C11	Rocker Peak	8000	5/2	37	14.6	20.2	-
12C11	Rocker Peak Pillow	8000	5/2	SP	17.8	19.8	-
12C12	Uncle Sam Gulch	6500	5/2	0	0.0	8.4	-

SP - Snow pillow observation - water content only.





# SNOW SURVEY DATA

AS OF MAY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
NO.	NAME	ELEVATION				LAST YEAR	AVERAGE

## MADISON RIVER

11E09	Big Springs	6500	4/29	30	14.1	12.7	17.0*
11D07	Call Road	8050	4/27	36	9.4	13.5	11.8*
11D12	Four Mile	6900	4/29	8	3.0	7.4	6.0*
11E05	Hebgen Dam	6550	5/1	10	3.6	10.4	5.8
11E10	Island Park	6315	4/29	23	9.4	5.5	9.7*
11E22	Lake Creek	6100	4/30	0	0.0	5.6	2.3*
11E28	Lion Mountain	8760	4/29	61	26.1	18.0	-
11D11	Lower Twin	7900	4/29	46	21.4	25.6	22.5*
11E31	Madison Plateau	7750	4/29	53	27.8	18.0	-
11E31	Madison Plateau Pillow	7750	4/29	SP	28.4	20.1	-
11E23	Meridian Creek	7000	No Measurement			9.5	8.0*
10E02	Norris Basin	7500				10.7	7.6*
11D03	North Meadow	7500	4/29	28	9.2	9.8	-
11E21	Potomageton Park	7150	4/30	23	10.5	10.7	10.2*
11E20	Sentinel Creek	8300	4/30	61	28.7	27.7	25.2*
11E33	Soap Bogus Divide	7600	4/30	48	17.4	20.4	-
11E24	Tepee Creek	8000	No Measurement			17.7	14.3*
11E08	Valley View	6500	4/29	29	13.8	12.1	13.0*
11E07	West Yellowstone	6700	5/1	15	6.2	7.0	6.2
11E07	West Yellowstone Pillow	6700	No Measurement			4.8	-
11E30	Whiskey Creek	6800	4/29	41	20.5	17.2	-

## GALLATIN RIVER

10D14	Arch Falls	7350	4/29	34	11.9	20.3	14.2*
11D09	Bear Basin	8150	4/28	45	19.2	30.2	23.2*
10D15	Bridger Bowl	7250	4/30	56	25.8	41.2	30.1*
10D15	Bridger Bowl Pillow	7250	4/30	SP	22.1	38.3	-
11E29	Carrot Basin	9000	No Measurement			41.5	-
11E29	Carrot Basin Pillow	9000	No Measurement			-	-
10D04	Devil's Slide	8100	4/29	58	22.0	35.2	25.7
10D03	Hood Meadow	6600	4/29	16	5.4	12.3	8.0
10D13	Lick Creek	6860	4/29	14	3.4	14.2	9.0*
10D13	Lick Creek Pillow	6860	4/29	SP	3.0	12.8	-
10D10	Little Park	7400	4/28	37	14.2	22.8	17.0*
10D18	Maynard Creek	6210	4/30	31	12.9	25.5	-
10D18	Maynard Creek Pillow	6210	4/30	SP	10.1	17.3	-
10D16	Shower Falls	8100	4/29	63	26.8	38.5	28.6*
10D16	Shower Falls Pillow	8100	4/29	SP	25.5	33.6	-
11E06	Twenty-One Mile	7150	5/2	40	20.2	17.4	16.0

SP - Snow pillow observation - water content only.





# SNOW SURVEY DATA

AS OF MAY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
NO.	NAME	ELEVATION				LAST YEAR	AVERAGE

## MISSOURI RIVER (Main Stem)

11C01	Boulder Mountain	7950	4/29	42	17.0	22.2	19.8*
12C05	Chessman Reservoir	6200	5/1	2	0.6	2.7	3.2
10C09	Deadman Creek	6450	4/30	0	0.0	8.4	-
10C09	Deadman Creek Pillow	6450	4/30	SP	0.0	7.5	-
10C07	Elk Peak	8000	5/1	28	10.8	20.4	19.7*
10C02	Grasshopper	7000	5/1	0	0.0	6.6	6.0*
10C01	Kings Hill	7500	5/1	31	10.8	17.4	14.7
12C01	Stemple Pass	6600	5/2	19	6.8	10.4	10.8
12C02	Ten Mile Lower	6600	5/1	6	2.0	4.5	5.3
12C03	Ten Mile Middle	6800	4/30	21	8.0	12.2	11.6
12C04	Ten Mile Upper	8000	4/30	37	14.6	16.8	16.0

## SUN-TETON-MARIAS RIVERS

13A15	Badger Pass	6900	5/4	78	39.0	45.1	42.0*
13A20	Blue Lake	5900	5/4	30	14.4	-	-
12B06	Cabin Creek	5200	4/29	0	0.0	0.9	2.2*
12B09	Five-Bull	5700	5/4	2	0.8	0.0	5.3*
12A01	Freight Creek	6000	5/4	10	3.5	9.5	16.4*
12B07	Goat Mountain	7000	4/30	19	7.2	8.0	11.8*
12B12	Mount Lockhart	6400	4/25	35	15.8	-	-
12B12	Mount Lockhart Pillow	6400	4/25	SP	16.0	-	-
12B13	Waldron	5600	4/25	0	0.0	-	-
12B13	Waldron Pillow	5600	4/25	SP	0.0	-	-
12B04	Wrong Creek	5700	4/29	10	3.2	7.4	13.0*
12B03	Wrong Ridge	6800	4/30	29	12.9	14.7	22.5*

## JUDITH RIVER

9C02	Avalanche	7100	4/29	43	15.4	32.6	-
9C01	Crystal Lake	6100	4/29	11	3.0	16.4	14.0*
9C03	Rock Creek	5600	4/29	6	1.0	9.4	-
10C06	Spur Park	8000	4/30	44	16.6	23.4	24.0*
10C06	Spur Park Pillow	8000	4/30	SP	17.9	24.8	-

## MUSSELSHELL RIVER

10C15	Daisy Peak	7600	4/24	6	2.0	-	-
10C13	Eagle Creek	7000	No Survey				
10C14	Forest Lake	6400	4/28	0	0.0	-	-
10C11	Haymaker	8050	No Survey				
10C12	Johnson Park	6450	4/24	0	0.0	-	-

SP - Snow pillow observation - water content only.



# SNOW SURVEY DATA

AS OF MAY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
NO.	NAME	ELEVATION				LAST YEAR	AVERAGE

## ST. MARY RIVER

13A18	Hudson Bay Divide	5800	4/28	30	13.8	19.4	21.5*
13A03	Iceberg Lake No. 3	5600	4/30	46	22.8	30.3	32.9
13A14	Josephine Lower No. 9	4900	5/1	33	13.8	11.9	20.1*
13A07	Mount Allen No. 7	5700	5/1	78	38.0	46.7	50.3
13A06	Piegan Pass No. 6	5500	5/1	64	31.8	36.9	43.6
13A08	Ptarmigan No. 8	5800	4/30	60	30.0	39.6	41.8

## UPPER YELLOWSTONE RIVER

10C05	Bald Ridge	7500	5/2	10	3.7	14.9	12.5*
9D01	Camp Senia	7890	5/1	21	6.2	10.7	8.2*
10E03	Canyon	7750	4/29	36	14.3	14.5	15.3*
9D07	Cooke Station	8150	4/29	43	18.8	20.6	-
10E06	East Entrance	7000	5/1	0	0.0	0.0	-
9D06	Fisher Creek	9100	4/29	86	40.0	40.6	-
9D06	Fisher Creek Pillow	9100	4/29	SP	35.4	35.6	-
9D05	Grizzly Peak	8400	5/2	37	11.7	23.6	22.0*
10D06	Independence	8000	4/30	36	14.8	18.4	17.9*
10E04	Lake Camp	7850	4/29	21	8.7	6.5	7.8
9E01	Lodgepole	8200	4/30	22	8.2	11.2	10.6
10E06	Lupine Creek	7300				12.7	8.0
10D12	Monument Peak	9000	4/30	67	27.2	32.2	27.4*
10D07	Northeast Entrance	7400	4/30	12	4.6	7.4	7.1
10D07	Northeast Entrance Pillow	7350	4/30	SP	4.3	7.5	-
10C03	Porcupine R. S.	6500	5/2	1	0.5	9.8	7.7*
10D10	Sacajawea	6550	4/30	15	6.3	16.9	12.1*
10C08	South Fork Shields	8100	5/2	49	20.2	29.4	27.2*
10E05	Sylvan Pass	7100	5/1	0	0.0	9.1	10.9*
9D04	Timberline Creek	8850	5/1	43	14.3	20.0	18.2*
9D08	White Mill	8700	4/29	65	27.4	29.9	-

SP - Snow pillow observation - water content only.





# SOIL MOISTURE DATA

AS OF MAY 1, 1969

(Inches)

SOIL MOISTURE STATION			SOIL PROFILE		CURRENT DATA		PAST RECORD	
NO.	NAME	ELEVATION	DEPTH	FIELD CAPACITY	DATE OF SURVEY	SOIL MOISTURE	LAST YEAR	**AVERAGE

## COLUMBIA RIVER BASIN

### Kootenai

15B15M	Baree Trail	3800	48	7.5	5/2	6.3	6.4	-
14A10M	Murphy Lake R.S.	3000	48	22.6	5/1	23.1	20.1	-
15A02M	Raven R.S.	3050	48	23.0	5/1	21.9	21.9	-

### Flathead

13A02M	Desert Mountain	5600	54	8.4	5/1	9.7	9.7	8.5
13A05M	Marias Pass	5250	54	6.5	5/1	5.9	5.9	6.0

### Clark Fork

13C13M	Black Pine	7100	48	10.0	4/28	9.0	7.6	-
13B19M	Seeley Lake R.S.	4030	48	11.9	5/1	11.6	-	-
13C03M	Skalkaho Summit	7260	48	10.8	5/1	10.3	9.7	-

### Bitterroot

13D18M	Gibbons Pass	7100	48	7.1	4/29	6.2	6.0	6.2
14C05M	Lolo Pass	5250	48	10.6	4/29	9.1	10.1	7.2

## MISSOURI RIVER BASIN

### Beaverhead

11E13M	Lakeview	6700	48	15.3	5/1	17.3	13.9	14.0
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### Madison

11D04M	Red Bluff	4800	40	4.7			2.2	2.4
11E07M	West Yellowstone	6700	48	6.5	4/28	4.1	2.9	-

### Gallatin

10D15M	Bridger Bowl	7250	48	17.0	4/30	16.7	16.0	-
11D02M	College Site	4856	54	14.5	5/2	15.5	12.8	12.7
10D13M	Lick Creek	6860	48	18.8	4/29	17.2	18.2	-
11E06M	Twenty-One Mile	7150	48	10.0	4/28	8.4	4.5	3.6

### Missouri Main Stem

10C01M	Kings Hill	7420	48	11.8	4/30	9.0	6.5	7.2
12C08M	Stemple Pass	6350	48	5.9	5/2	5.4	5.3	5.2

### Yellowstone

10D11M	Battle Ridge	6020	48	17.6	4/30	14.4	14.8	15.3
10D07M	Northeast Entrance	7350	48	9.4	5/1	10.4	6.4	7.5

\*\*AVERAGE FOR PERIOD OF RECORD





# RESERVOIR STORAGE DATA

AS OF APRIL 30, 1969

(1000 Acre Feet)

BASIN	RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE		
			THIS YEAR	LAST YEAR	AVERAGE

## COLUMBIA RIVER BASIN

Flathead	Hungry Horse	3,428.0	2,044.0	2,304.0	1,974.0**
	Flathead Lake	1,791.0	1,266.0	707.4	933.7
	Camas (Sum of 4)	45.2	28.9	27.6	35.1
	Mission Valley (Sum of 8)	100.3	77.7	44.6	42.0
Clark Fork	Georgetown Lake	31.0	25.5	23.8	21.7
	Nevada Creek	12.6	12.6	10.8	8.9
	Noxon Rapids	334.6		101.1	144.9**
Bitterroot	Como	34.9	24.5	22.1	17.3
	Painted Rocks	31.7	32.1	26.1	27.3

## MISSOURI RIVER BASIN

Beaverhead	Clark Canyon	328.9	159.1	157.7	139.1**
	Lima	84.0	67.2	57.6	42.7
Ruby	Ruby	38.8		36.0	35.2
Madison	Hebgen Lake	377.5	294.3	242.5	195.9
	Ennis Lake	41.0	39.9	28.7	35.3
Gallatin	Middle Creek	8.0	5.2	3.5	4.6
Missouri	Canyon Ferry	2,043.0	1,603.0	1,345.0	1,572.0**
	Hauser & Helena	61.9	61.3	73.1	57.0
	Lake Helena	10.4	10.2	10.7	8.8
	Holter Lake	81.9	76.3	79.4	63.6
	Smith River	10.7	11.4	11.4	8.7**
	Durand	7.0	7.0	7.0	5.8
	Martinsdale	23.1	13.8	10.3	10.1
	Deadman's Basin	72.2	56.5	58.2	51.9
	Fort Peck	19,410.0	16,950.0	16,410.0	11,190.0
	Gibson	105.0	51.2	39.9	58.0
Sun	Willow Creek	32.2	25.0	19.4	24.3
	Pishkun	32.0	30.6	26.1	21.3
	Lower Two Medicine	16.6		13.7	1.9
Marias	Four Horns	19.2		12.8	12.5
	Swift	30.0	22.7	17.0	24.2
	Lake Frances	112.0	96.5	73.2	86.8
	Tiber	1,313.0	545.9	429.8	654.6**
Milk	Fresno	127.2	131.3	100.6	107.3
	Nelson	66.8	51.0	49.4	45.6
	Lake Sherburne	66.1	39.4	10.6	19.4
Yellowstone	Mystic Lake	20.8	4.0	2.8	3.3
	Tongue River	68.0	52.6	36.0	27.4
	Cooney	27.5	22.8	15.5	15.9
Big Horn	Yellowtail	1,356.0	779.3	721.2	-



# Agencies and Organizations Cooperating in Montana Snow Surveys

U. S. Forest Service  
Region I, Missoula, Montana  
Montana Forests and Ranger  
Districts

U. S. Geological Survey  
Helena, Montana  
Portland, Oregon

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Walla Walla, Washington  
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St. Ignatius, Montana

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Red Rock Lakes Refuge  
Monida, Montana

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Billings, Montana  
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Portland, Oregon

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Montana, Wyoming, Idaho

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Helena, Montana

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Agricultural Experiment Station  
Havre, Montana

Montana State University  
Agricultural Experiment Station  
Bozeman, Montana

University of Montana  
School of Forestry  
Missoula, Montana

Water Rights Branch, Dept. of  
Lands and Forests  
Victoria, British Columbia

Department of Energy, Mines and  
Resources  
Calgary, Alberta



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# **WATER SUPPLY OUTLOOK FOR MONTANA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,  
and  
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF  
MAY 15, 1969



## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

## PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85205
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80521
Idaho	P. O. Box 38, Boise, Idaho 83707
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Building, Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 340, Casper, Wyoming 82602

## PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia





# **WATER SUPPLY OUTLOOK FOR MONTANA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

*Issued by*

**KENNETH E. GRANT**

ADMINISTRATOR  
SOIL CONSERVATION SERVICE  
WASHINGTON, D.C.

|||||  
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STATE CONSERVATIONIST  
SOIL CONSERVATION SERVICE  
Bozeman, Montana

*In Cooperation with*

**J. A. ASLESON**

DIRECTOR  
Montana Agricultural Experiment Station

|||||  
*Report prepared by*

**P. E. FARNES, Snow Survey Supervisor**

SOIL CONSERVATION SERVICE  
P.O. Box 98  
Bozeman, Montana 59715



## MONTANA WATER SUPPLY OUTLOOK

May 15, 1969

A May 15 water supply outlook is published this year to enable users of snow survey information to receive data currently.

Snowmelt at higher elevations was well above average for the May 1 - May 15 period.

All Montana snow courses measured on or about May 15 have below average water equivalents.

Most streams in the State have high water with very little flooding so far. With the lack of low elevation snow and loss of moisture in soils at lower elevations, excessive amounts of precipitation will be necessary to cause streams to leave their banks.

The June 1 report will be released as soon as data are available.





# SNOW SURVEY DATA

AS OF MAY 15, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

## COLUMBIA RIVER BASIN

### KOOTENAI RIVER

15A11	Bald Eagle Peak	5700	5/13	100	55.5	-	-
15A08	Banfield Mountain	5600	5/15	26	13.4	-	-
15B11	Baree Creek	5500	5/15	63	32.0	33.6	43.4*
15B16	Baree Midway	4600	5/15	34	19.2	12.4	-
15B15	Baree Trail	3800	5/15	0	0.0	0.0	0.0*
15A10	Bristow Creek	3900	5/15	0	0.0	-	-
15A13	Cedar Grove	4100	5/13	0	0.0	-	-
15A04	Davis Creek	5400	5/14	0	0.0	-	-
15A05	Garver Creek	4250	5/14	0	0.0	-	-
BC 11	Glacier	4100	5/15	29	15.5	26.7	22.3*
14A11	Graves Creek	4300	5/16	5	2.6	5.2	10.5*
BC 43	Gray Creek	5100	5/15	27	10.5	17.2	18.4*
15A03	Hawkins Lake	6450	5/14	59	31.0	-	-
BC 33	Kicking Horse	5400	5/14	10	4.0	12.1	10.6*
15A09	Lost Soul	4800	5/15	0	0.0	-	-
BC 32	Marble Canyon	5000	5/14	0	0.0	10.4	8.3*
BC 10B	Morrissey Ridge	6100	5/14	27	15.0	18.3	25.0*
15A12	Poorman Creek	5100	5/13	44	23.7	-	-
15A01	Red Mountain	6000	5/15	23	11.5	13.7	18.2
14A12	Stahl Peak	6050	5/16	69	40.4	-	-
BC 20A	Sullivan Mine	5100	5/14	9	4.5	6.1	7.6*
14A07	Weasel Divide	5450	5/16	48	25.2	28.0	33.2





# SNOW SURVEY DATA

AS OF MAY 15, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

## FLATHEAD RIVER

14A03	Hell Roaring Divide	5770				21.4	27.5*
13B07	North Fork Jocko	6330	5/15	51	29.1	38.7	46.2*

## CLARK FORK RIVER

13C13	Black Pine	7100	5/16	7	3.2	10.4	11.8*
13C13	Black Pine Pillow	7100	5/16	1	0.5	11.4	-
14C10	Heart Lake Trail	4800	5/15	7	3.2	4.4	-
15C10	Hoodoo Basin	6000	5/15	76	41.8	44.8	-
15C10	Hoodoo Basin Pillow	6000	No Measurement			41.5	-
15C01	Hoodoo Creek	5900	5/15	74	38.8	39.4	42.5*
15B02	Lookout	5250	5/15	53	26.6	22.7	-
13C03	Skalkaho Summit	7260	5/16	29	13.8	23.4	25.2*
14B01	TV Mountain	6800				16.9	-

## BITTERROOT RIVER

13D02	Gibbons Pass	7100	5/16	20	10.0	15.6	19.6*
14C07	Lost Horse	5940	5/13	46	23.0	25.8	29.0*
13D22	Saddle Mountain	7940	5/16	45	22.2	27.0	27.6*
14C13	Twelvemile Creek	5600	5/13	0	0.0	1.1	-
14C13	Twelvemile Creek Pillow	5600	5/13	SP	0.0	0.0	-
14C08	Twin Lakes	6510	5/13	63	33.1	40.0	44.0*

SP - Snow pillow observation - water content only.



# SNOW SURVEY DATA

AS OF MAY 15, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

## MISSOURI RIVER BASIN

### JEFFERSON RIVER

12C09	Copper Mountain	7700	5/15	0	0.0	10.8	-
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### GALLATIN RIVER

10D14	Arch Falls	7350	5/14	21	8.6	17.9	13.4*
10D15	Bridger Bowl	7250	5/15	33	18.1	39.7	27.6*
10D15	Bridger Bowl Pillow	7250	5/15	SP	13.0	37.5	-
10D04	Devil's Slide	8100	5/14	45	20.4	33.7	26.0*
10D03	Hood Meadow	6600	5/14	1	0.5	8.5	5.7*
10D13	Lick Creek	6860	5/14	0	0.0	8.0	7.3*
10D13	Lick Creek Pillow	6860	5/14	SP	0.0	8.3	-
10D18	Maynard Creek	6210	5/15	8	3.5	20.6	-
10D18	Maynard Creek Pillow	6210	5/15	SP	4.8	17.8	-
10D16	Shower Falls	8100	5/14	43	21.3	36.3	28.5*
10D16	Shower Falls Pillow	8100	5/14	SP	20.3	34.0	-

### MISSOURI RIVER (Main Stem)

10C09	Deadman Creek	6450	5/15	0	0.0	5.0	-
10C09	Deadman Creek Pillow	6450	5/15	SP	0.0	3.4	-
10C01	Kings Hill	7500	5/15	13	4.8	17.5	14.5*

### JUDITH RIVER

10C06	Spur Park	8000	5/15	23	10.2	25.6	24.0*
10C06	Spur Park Pillow	8000	5/15	SP	10.6	24.5	-

### UPPER YELLOWSTONE RIVER

9D01	Camp Senia	7890	5/15	8	2.8	9.7	8.4*
9D07	Cooke Station	8150	5/13	28	14.0	17.2	-
9D06	Fisher Creek	9100	5/13	73	36.8	37.6	-
9D06	Fisher Creek Pillow	9100	5/13	SP	33.0	32.5	-
10D07	Northeast Entrance	7400	5/13	0	0.0	2.6	-
10D07	Northeast Entrance Pillow	7350	5/13	SP	0.0	2.2	-
9D04	Timberline Creek	8850	5/15	23	9.0	17.8	17.8*
9D08	White Mill	8700	5/13	52	25.0	26.4	-

SP - Snow pillow observation - water content only.





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U. S. Forest Service  
Region I, Missoula, Montana  
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Portland, Oregon

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Seattle, Washington  
Walla Walla, Washington  
Omaha, Nebraska

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St. Ignatius, Montana

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Helena, Montana  
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Havre, Montana

Montana State University  
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School of Forestry  
Missoula, Montana

Water Rights Branch, Dept. of  
Lands and Forests  
Victoria, British Columbia

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FEDERAL - STATE - PRIVATE  
**COOPERATIVE SNOW SURVEYS**

Furnishes the basic data  
necessary for forecasting  
water supply for irrigation,  
domestic and municipal water  
supply, hydro-electric power  
generation, navigation,  
mining and industry

*"The Conservation of Water begins  
with the Snow Survey"*